Ordering number : EN1840A



Monolithic Linear IC

LA1186N

FM Front End for Radio-Cassette Recorders, Music Centers

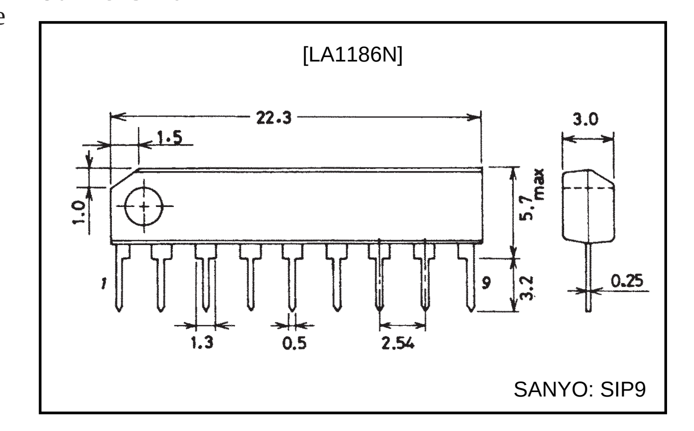
Features and Functions

- Contains RF amplifier, MIX, OSC, AFC diode.
- Operating voltage : 1.8 to 8.0V.
- Improvement in cross modulation characteristic due to the use of double-balanced MIX.
- Improvement in strong input characteristic.
- Minimum number of external parts required.
- Less spurious radiation from local OSC.
- TV (1 to 12 channel) receive capability.

Package Dimensions

unit: mm

3017C-SIP9



Specifications

Maximum Ratings at Ta=25°C

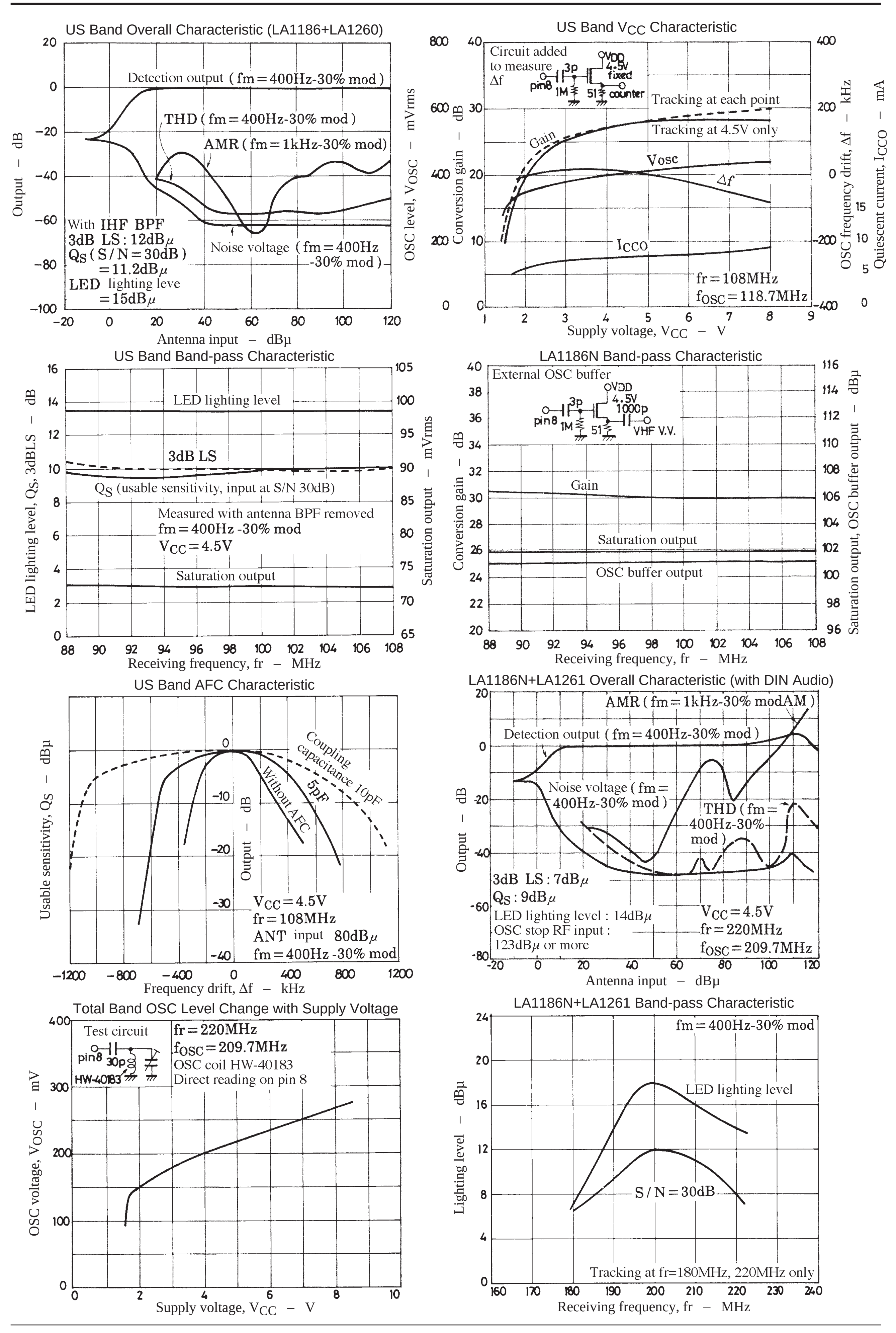
Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max		8.0	V
Maximum pin voltage	V3-5		12	V
	V6-5		V_{CC}+0.8	V
Allowable power dissipation	Pd max	Ta≤80°C	150	mW
Operating temperature	Topr		–20 to +80	°C
Storage temperature	Tstg		–40 to +125	°C

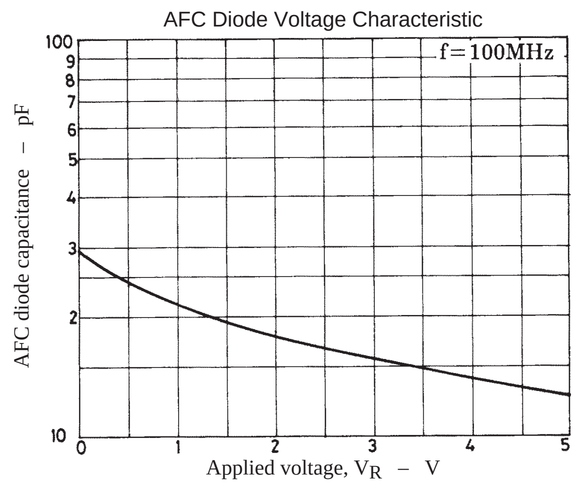
Operating Conditions at Ta=25°C

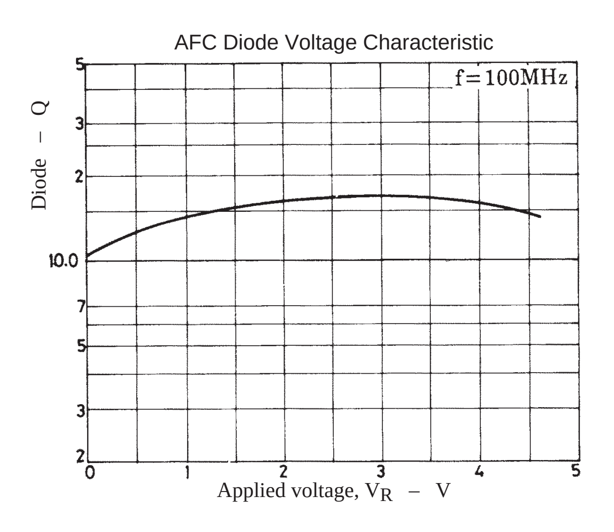
Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}		4.5	V
Operating voltage range	V_{CC} op		1.8 to 7.5	V

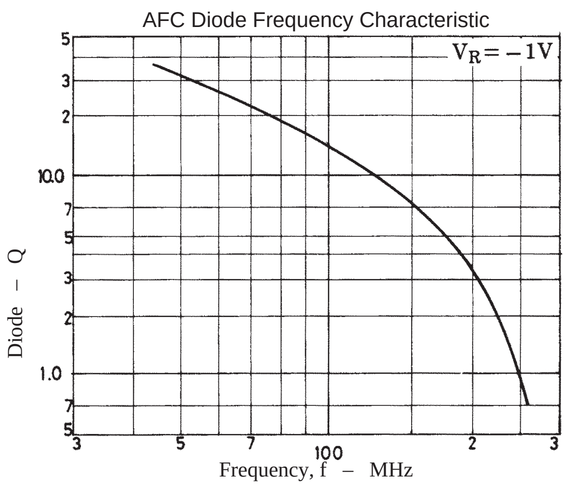
Electrical Characteristics at Ta=25°C, V_{CC}=4.5V, f_r=108MHz, f_{OSC}=118.7MHz, See specified Test Circuit.

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Current dissipation	I_{CC}	Quiescent		7.0	9.5	mA
Output saturation voltage	Vo	V_{IN}=100dBµ	95	115	135	V
Local OSC voltage	V_{OSC}	V_{CC}=2V	200	315		mVrms
Oscillation stop voltage				1.4	1.8	V

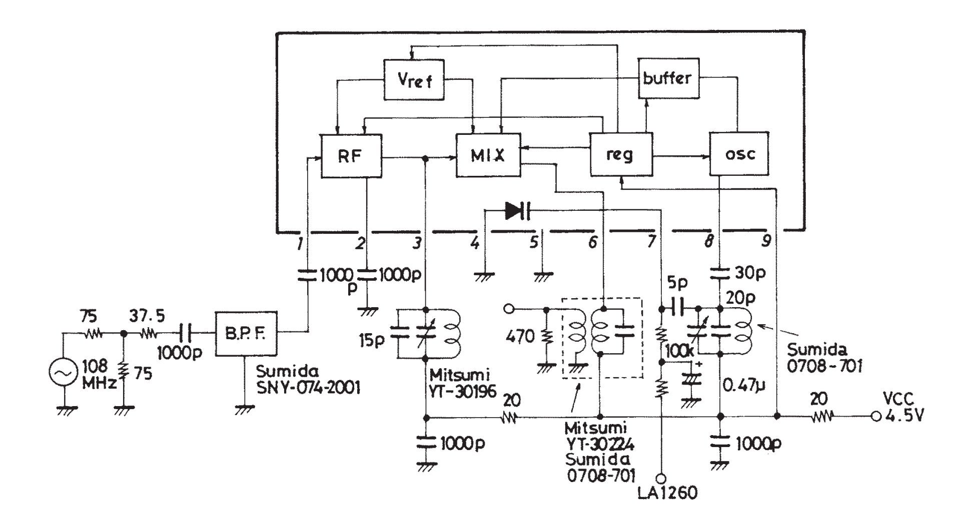

US Band Overall Characteristic (LA1186+LA1260)
Detection output (fm = 400Hz-30% mod)
THD (fm = 400Hz-30% mod)
AMR (fm = 1kHz-30% mod)
With IHF BPF
3dB LS : 12dBμ
QS (S / N = 30dB) = 11.2dBμ
LED lighting leve = 15dBμ
Noise voltage (fm = 400Hz -30% mod)
Output – dB
Antenna input – dBμ
US Band VCC Characteristic
Circuit added to measure Δf
pin8 3p 1M 51 VDD 4.5V fixed counter
Tracking at each point
Tracking at 4.5V only
Gain
Vosc
Δf
ICCO
fr = 108MHz
fOSC = 118.7MHz
OSC level, VOSC – mVrms
Conversion gain – dB
OSC frequency drift, Δf – kHz
Quiescent current, ICCO – mA
Supply voltage, VCC – V
US Band Band-pass Characteristic
LED lighting level
3dB LS
QS (usable sensitivity, input at S/N 30dB)
Measured with antenna BPF removed
fm = 400Hz -30% mod
VCC = 4.5V
Saturation output
LED lighting level, QS, 3dBLS – dB
Saturation output – mVrms
Receiving frequency, fr – MHz
LA1186N Band-pass Characteristic
External OSC buffer
pin8 3p 1M 51 VDD 4.5V 1000p VHF V.V.
Gain
Saturation output
OSC buffer output
Conversion gain – dB
Saturation output, OSC buffer output – dBμ
Receiving frequency, fr – MHz
US Band AFC Characteristic
Coupling capacitance 10pF
5pF
Without AFC
VCC = 4.5V
fr = 108MHz
ANT input 80dBμ
fm = 400Hz -30% mod
Usable sensitivity, QS – dBμ
Output – dB
Frequency drift, Δf – kHz
LA1186N+LA1261 Overall Characteristic (with DIN Audio)
AMR (fm = 1kHz-30% modAM)
Detection output (fm = 400Hz-30% mod)
Noise voltage (fm = 400Hz-30% mod)
THD (fm = 400Hz-30% mod)
3dB LS : 7dBμ
QS : 9dBμ
LED lighting level : 14dBμ
OSC stop RF input : 123dBμ or more
VCC = 4.5V
fr = 220MHz
fOSC = 209.7MHz
Output – dB
Antenna input – dBμ
Total Band OSC Level Change with Supply Voltage
Test circuit
pin8 30p HW-40183
fr = 220MHz
fOSC = 209.7MHz
OSC coil HW-40183
Direct reading on pin 8
OSC voltage, VOSC – mV
Supply voltage, VCC – V
LA1186N+LA1261 Band-pass Characteristic
fm = 400Hz-30% mod
LED lighting level
S / N = 30dB
Tracking at fr=180MHz, 220MHz only
Lighting level – dBμ
Receiving frequency, fr – MHz





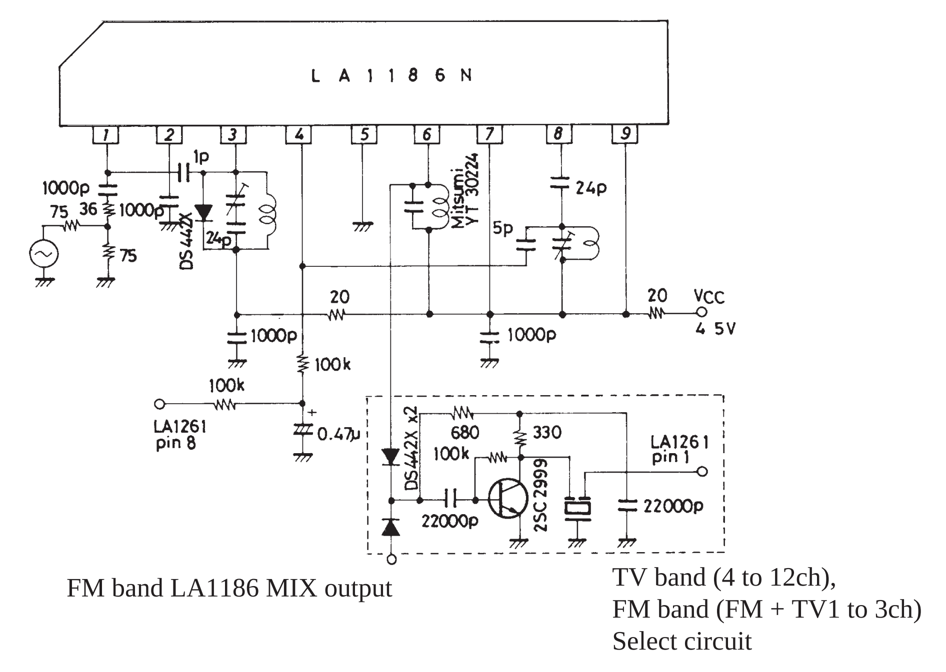


US Band Test Circuit



Unit (resistance : Ω, capacitance : F)

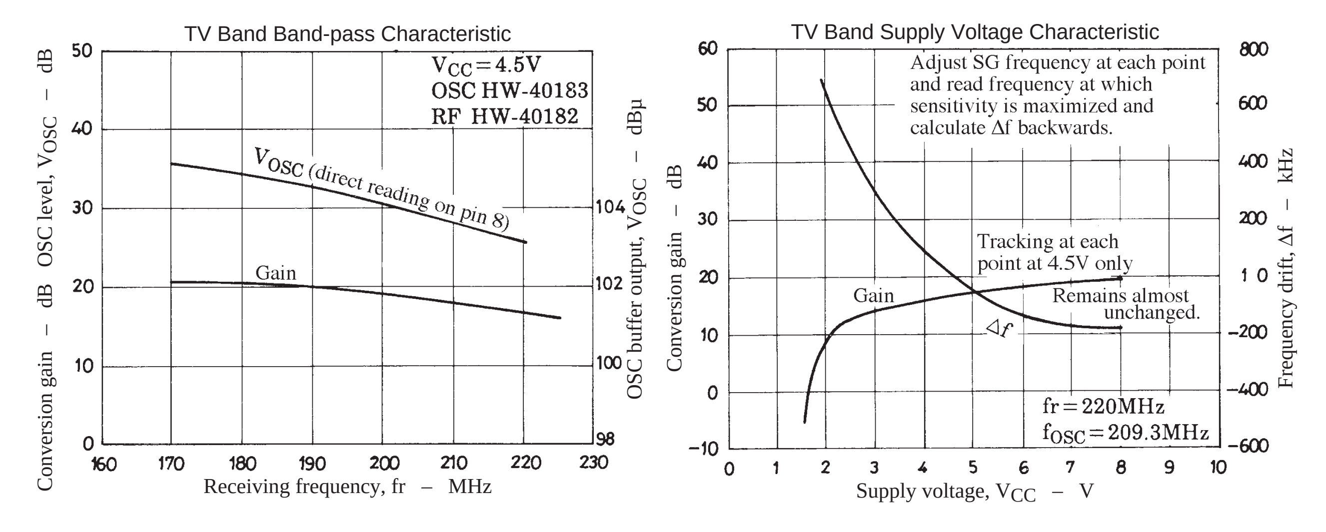
Sample Application Circuit for TV Band



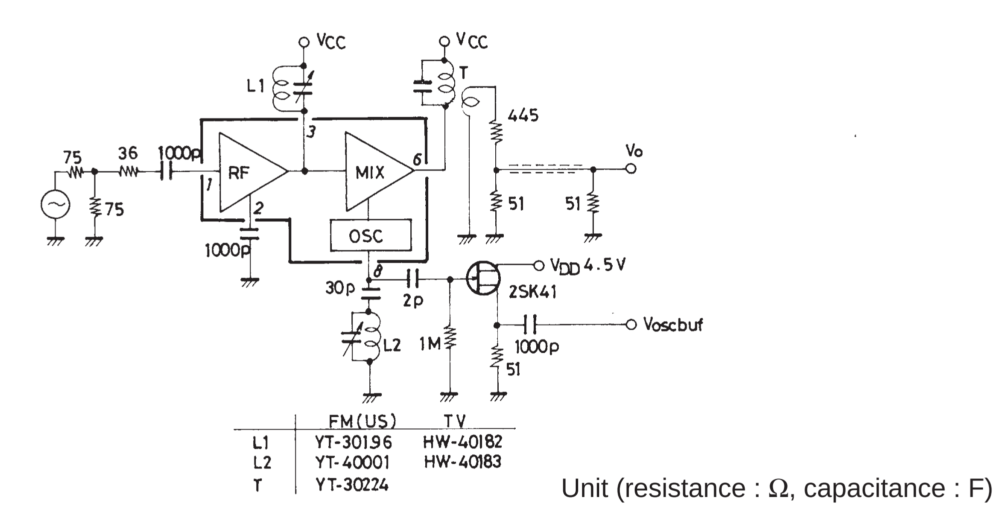
FM band LA1186 MIX output

TV band (4 to 12ch),
FM band (FM + TV1 to 3ch)
Select circuit

Unit (resistance : Ω, capacitance : F)

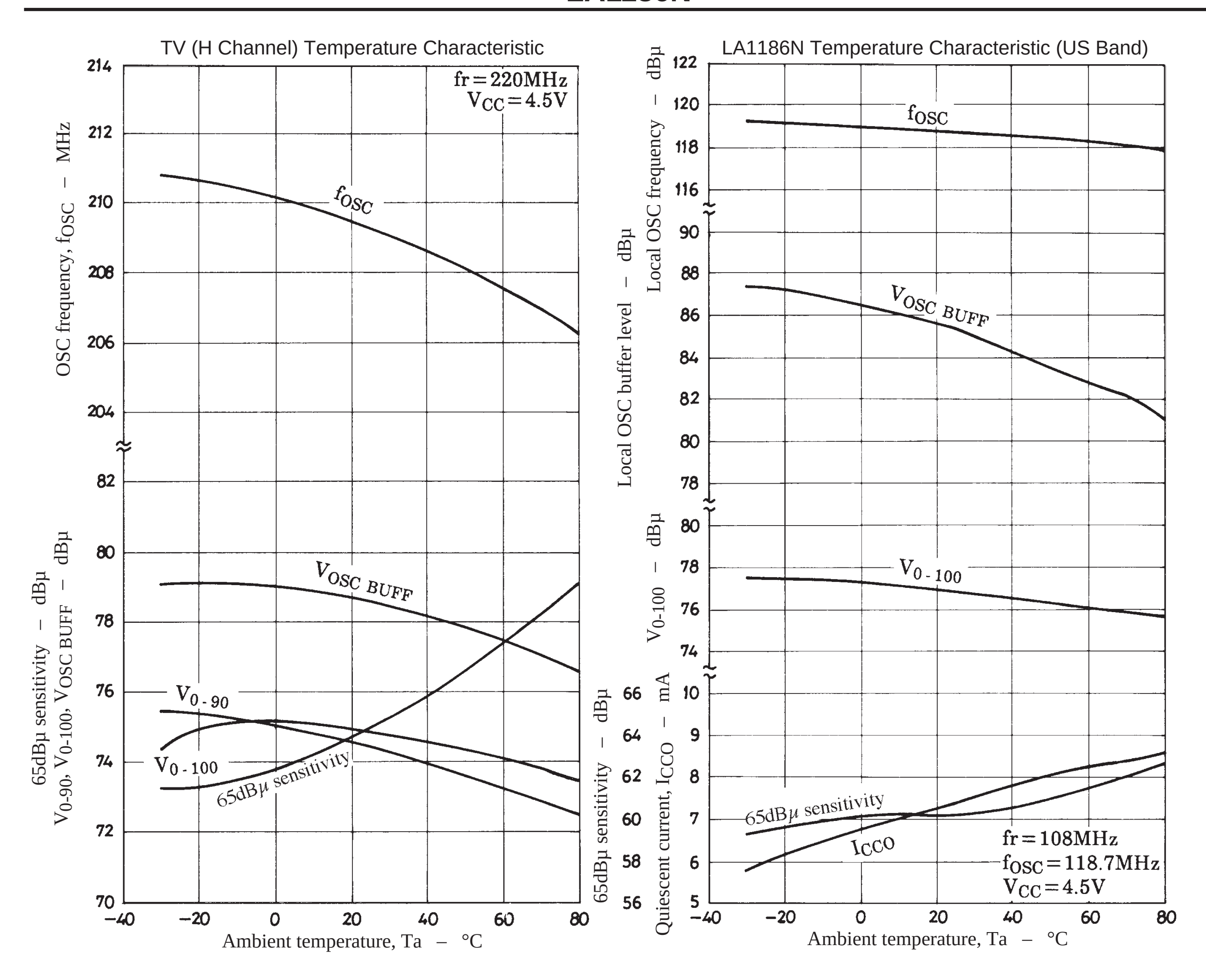


LA1186N Temperature Characteristic Test Circuit



	FM(US)	TV
L1	YT-30196	HW-40182
L2	YT-40001	HW-40183
T	YT-30224	

Unit (resistance : Ω, capacitance : F)



(Note) 65dBμ sensitivity : Input at 65 dBμ in Temperature Characteristic Test Circuit